Complexation and redox interactions between aqueous plutonium and manganese oxide interfaces

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Manganese oxides are present throughout the environment, and their interaction with plutonium is of interest for the remediation of nuclear waste. There can be several manganese valence states in one oxide mineral, and plutonium can simultaneously exist in up to four different oxidation states. Therefore, there is a high probability that redox reactions will occur between the manganese and plutonium ions sorbed to the oxide surface.
To understand these interfacial reactions, we are studying the sorption of aqueous plutonium ions in single oxidation states on oxide minerals as a function of pH, ionic strength, and concentration. The sorbed plutonium complexes have been analyzed spectroscopically to determine oxidation states and the structures of the sorbed species.

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